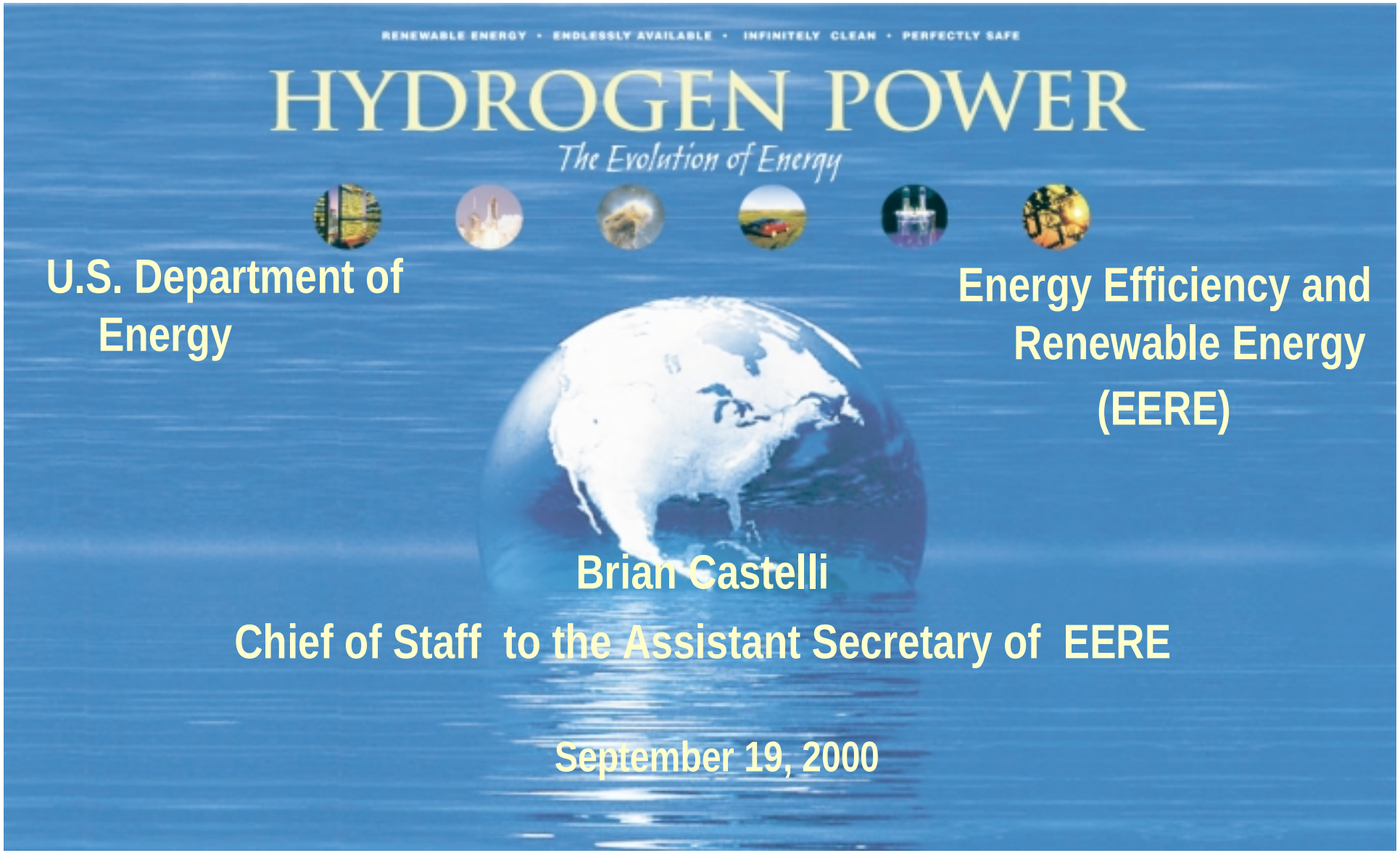
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy



U.S. Department of Energy

Energy Efficiency and Renewable Energy (EERE)

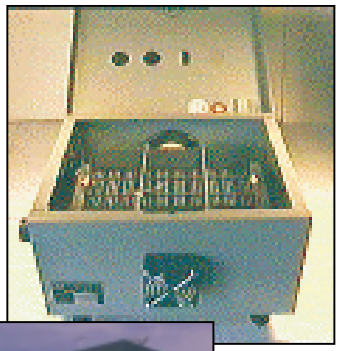
Brian Castelli

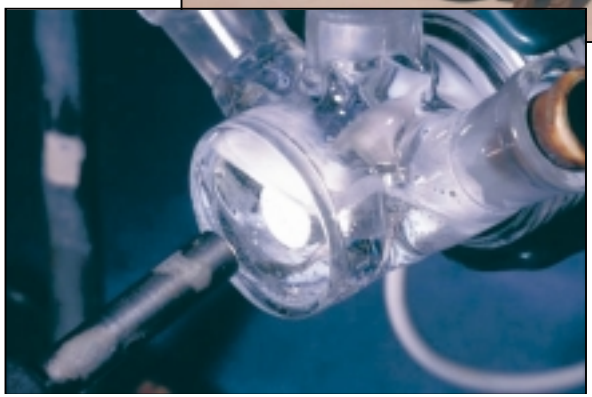
Chief of Staff to the Assistant Secretary of EERE

September 19, 2000

Strategic Directions

- **Distributed Generation**
  - Collaborate on 50-75 kW Fuel Cells
- **Fuel Choice Infrastructure**
  - 50-150 kW Reformers
  - Provide On-board Hydrogen Storage Systems
- ★ **Coal to Hydrogen with Sequestration**
- **Renewable Hydrogen Production**
  - Biomass
  - Wind/Hydrogen
  - Direct

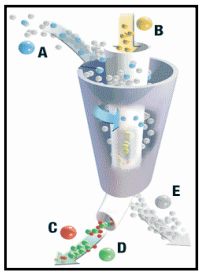




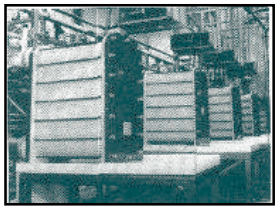
Program Metrics

1995:
$28 - $35 / MBtu

- Reduce Production Cost of Hydrogen
- Improve Efficiency
- Advanced Reformer Technology
- Design for Manufacturing Concepts



Ion Transport Membrane
Air Products & Chemicals



Reversible Fuel Cell
National Power

1995:
$10,000/kW

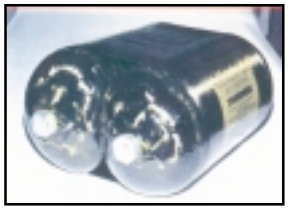
- Increase Fuel Efficiencies
- Reduce Fuel Cell Costs
- Reduce Overall System Costs

$12 - $15/Mbtu
(pressurized)

$300/kW -
PEM Electrolyzer
$600/kW -
Reversible FC

2020

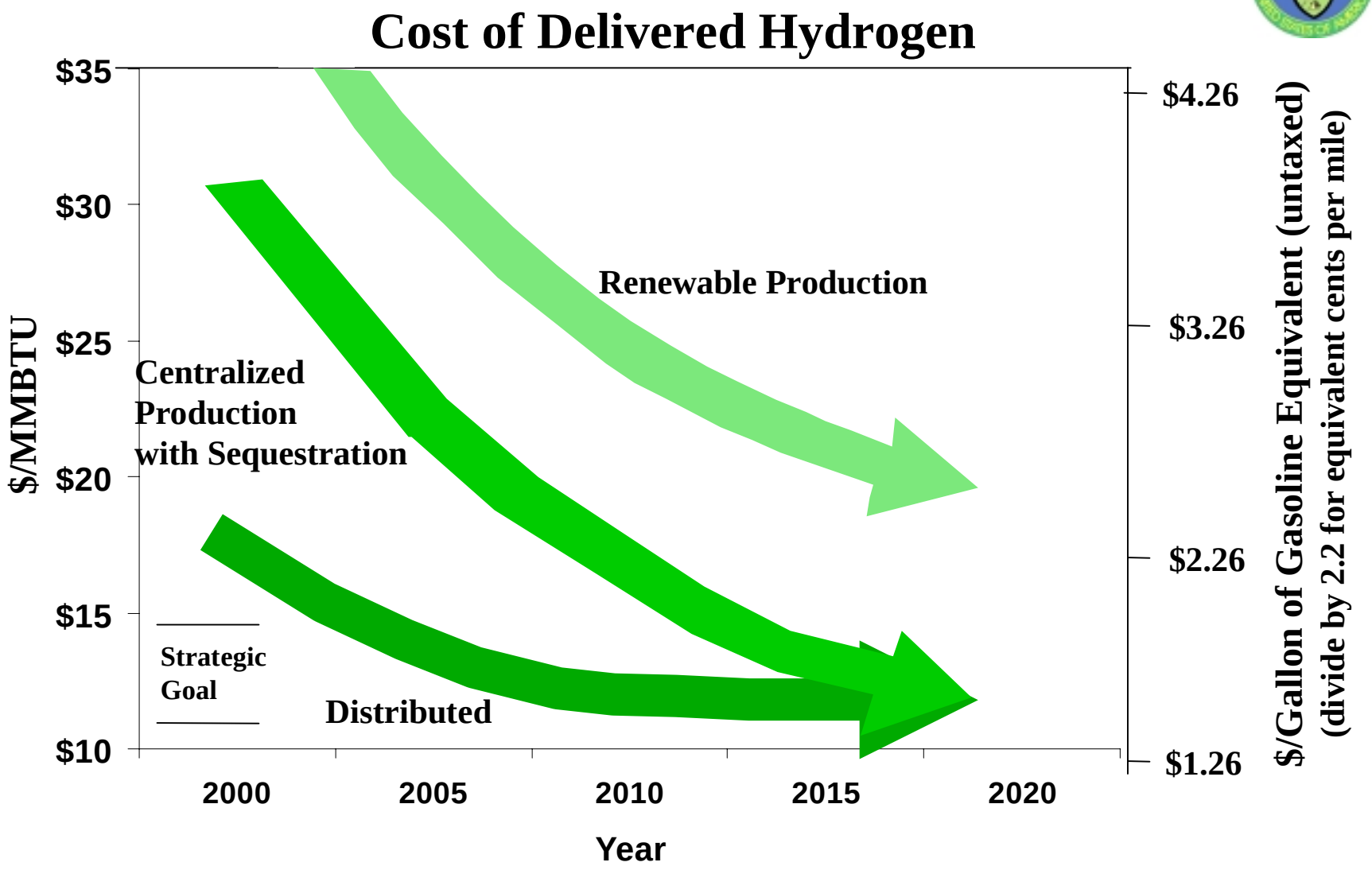
5.5% system weight
(5.5-10% Hydride to CG)



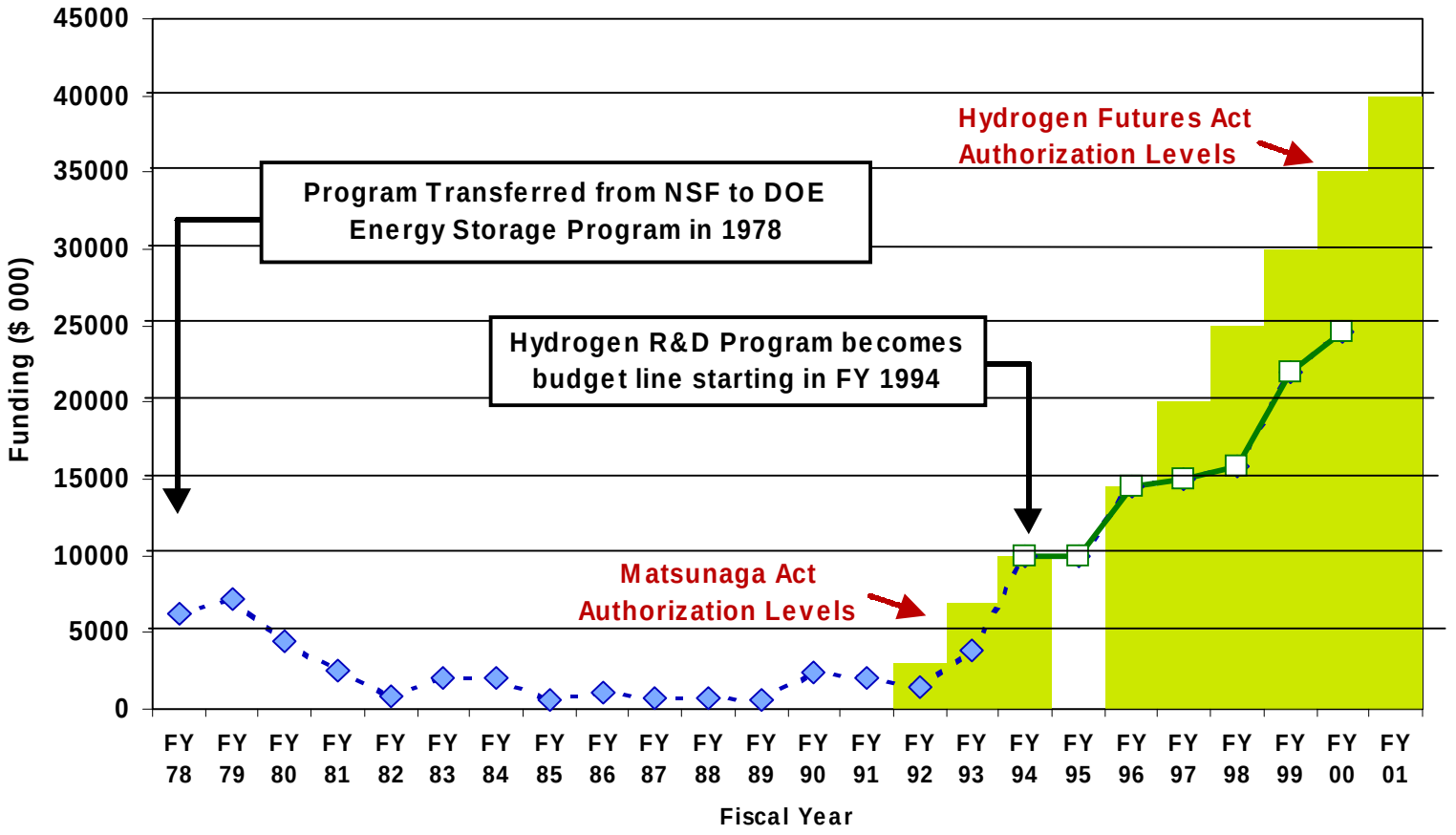
Conformable Tanks
Thiokol Populsion

1995:
2.5% system weight

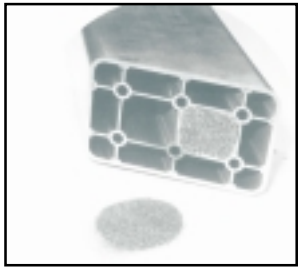
- Address Energy Consumption Issues
- Address Safety Issues
- Development of Advanced Storage Concepts


Cost of Delivered Hydrogen
$35
$30
$25
$20
$15
$10
$/MMBTU
$4.26
$3.26
$2.26
$1.26
$/Gallon of Gasoline Equivalent (untaxed)
(divide by 2.2 for equivalent cents per mile)
Renewable Production
Centralized
Production
with Sequestration
Strategic
Goal
Distributed
2000
2005
2010
2015
2020
Year

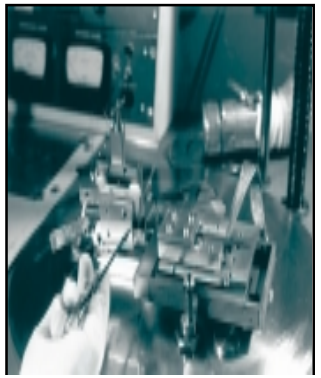
Hydrogen Program Funding Summary

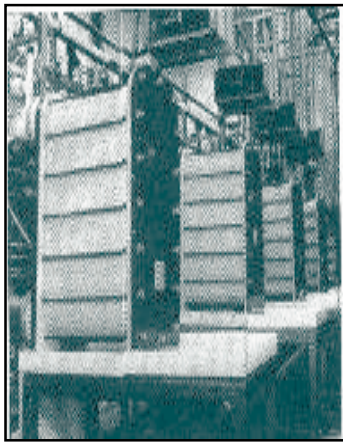


Key Events for Next Year



- Operation of Hydrogen Fueling Station
- Demonstration of Light-weight Pressurized Storage Tanks
- Demonstration of Hydride Storage System with Metallic Catalyst
- Demonstration of .01 Gram Carbon Nanotube Material
- Demonstration of Reversible Fuel Cell





Workshop on Hydrogen Production of Hydrogen from Fossil Fuels With Carbon Sequestration

HYDROGEN POWER

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